REMARKS

Claims 1-20 are pending. Claim 1-3, 14, and 15 have been amended for clarification purposes, claims 18-20 have been added, and the abstract has been replaced with one which better conforms to the requirements of MPEP § 608.01(b). Claims 5, 7-10, 13, and 17 have been indicated to recite allowable subject matter.

Reconsideration of the application is respectfully requested for the following reasons.

In the Office Action, the Examiner rejected claims 1-3 and 6 under 35 U.S.C. §103(a) for being obvious in view of a combination formed between the Barber and Rhoads patents. Applicants traverse this rejection for the following reasons.

In the Background of the Invention section of Applicant's specification, conventional image searching systems are discussed. These systems generally consist of two types. The first type searches an image database using a data structure which does not take into consideration changes in recent feedback patterns. Instead, these systems operate based on whole system feedback information. Further, such feedback may not involve a user at all. Consequently, systems of this type return inaccurate search results as the number of recent feedback pattern changes increase. (See page 3, lines 1-21).

The second type performs image database searches using a data structure which does not take the whole feedback pattern of the system into consideration. Instead, in these systems "the characteristics of the corresponding image cannot be reflected, and the reliability of the image feature information greatly deteriorates due to the irregular feature weight learning." (See page 3, line 22 - page 4, line 10).

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Applicants invention overcomes the drawbacks of the conventional image searching systems by providing a data structure which includes both recent user feedback pattern information and whole feedback pattern information. Such a data structure is advantageous because it allows weights of image features to be determined more accurately than would be determined using either type of information alone. The images features may then be used to perform an image search whose results will inevitably prove to be more reliable. The claims recite features which allow Applicants' invention to achieve this improved performance.

Claim 1 recites a multimedia data structure which reflects a change of user relevance feedback for determining weights of image features used for an image search. The data structure includes (a) information describing at least one feature of a certain image, (b) recent user feedback information based on user relevance feedback, and (c) whole feedback information based on the user relevance feedback.

In order to establish a *prima facie* case of obviousness for claim 1, two requirements must be satisfied. First, the cited references must teach or suggest all the features in claim 1. Second, there must have been some teaching or suggestion in existence at the time the claimed invention was made that would have led one of ordinary skill in the art to combine the references in an attempt to form the invention. See MPEP §2143.01 and *In re Rouffet*, 47 USPQ.2d 1459 (Fed. Cir. 1997).

The Barber patent discloses a system which searches for images in a database. In developing a query for a search, the system generated a weighted characteristic which relates to

an image having a desired color, texture, size, and shape. This characteristic is then used as a basis for searching a database of thumbnail images. The results are then displayed.

Claim 1 is different from the Barber patent in at least two respects.

First, claim 1 recites a data structure having recent user feedback information based on user relevance feedback. The Barber patent does not teach or suggest a data structure having this information.

Second, claim 1 recites that the data structure also includes whole feedback information based on the user relevance feedback. The Barber patent also fails to teach or suggest a data structure having this information.

The Examiner acknowledged that the Barber patent omits these two features. (See page 3 of the Office Action). To make up for these differences, the Rhoads patent was cited. In rejecting claim 1, the Examiner took the position that the Rhoads patent discloses a data structure which is used to perform image database searches. The Examiner also alleged that this data structure includes recent user feedback information and whole feedback information of the type included in the claimed invention. Applicants respectfully disagree for the following reasons.

First, the Rhoads patent discloses a system for acquiring images, and more specifically images of objects which have been distorted or blurred. These images are acquired by processing raw images from an imaging source to create clear wide-field images. The objects being imaged include stars as seen through a telescope, and the processing steps used to generate the clean

wide-field image include eliminating distortion in the raw images. See column 1, lines 6-42; column 2, line 64 - column 3, line 6; and claims 1-7 of the Rhoads patent.

The specification, claims, and drawings of the Rhoads patent all make clear that its system is concerned with <u>acquiring</u> images from a telescope. This is very different from the claimed invention, which in accordance with at least one embodiment focuses on <u>searching a database of existing images</u>. More specifically, the claimed invention relates to a data structure which may be used as a basis for searching a database to locate an image having a set of desired characteristics. The Rhoads system does not search a database of images. It therefore logically follows that Rhoads <u>does not teach or suggest a data structure which may be used to perform this function</u>.

Second, claim 1 recites a data structure which includes <u>recent user feedback information</u> derived from user relevance feedback. In the Office Action, the Examiner relied on column 35, lines 29-39, of the Rhoads patent to provide this feature of the invention. This portion of Rhoads discloses:

> Each member of this set of universal basis functions 226 forms the basic element where an unambiguous weighted average will take place . . . The following step 227 is, in broadest terms, the step where a **user inputs the parameters** which will control later processing methods. here, a choice is explicitly made as to which reversion methodology will be utilized inside the **inner loops 230 and 232**; the preferred method of the "window function," as will be described later, is referenced as the usual choice. (Emphasis added).

The foregoing passage references Fig. 10. From the Rhoads patent, it is clear that this figure shows steps included for processing an acquired image into a clear wide-field image, as

previously discussed. As indicated above, this processing function is performed based on a set

of user-designated parameters and two process loops. The first loop 230 "steps through all E

acquired digital images (and their corresponding distortion information)" and the second loop

232 steps through a series of basis functions with respect to these images. (See column 36, lines

26-35).

The Rhoads patent therefore makes clear that column 35, lines 29-39, (i.e., the portion

of Rhoads cited by the Examiner in the Office Action) does not in any way relate to a data

structure having <u>recent user feedback information</u>, as recited in claim 1. Rather, this portion of

Rhoads addresses how a raw image may be processed to generate a distortion-free image based

on steps included two image processing loops. Recent user feedback information, either of the

type contemplated by the claimed invention or any other type, is never taken into consideration.

Third, claim 1 recites a data structure which includes <u>whole feedback information</u> derived

from user relevance feedback. In the Office Action, the Examiner relied on column 35, lines 40-

50, of the Rhoads patent to provide this feature of the invention. This portion of Rhoads

discloses:

> Suffice it to say that steps 234 and 235 are dealt with in great detail in the
> description of the specific preferred embodiment. Also, reference is made to the
> **"compressed H matrix"** in 234 and 235. This language is chosen since it is
> perhaps the most concise way of describing what is required at this stage: an
> information efficient encodation of either the rows or the columns of H in
> equation 1. Because the rows and columns are variant, BUT relatively low
> frequency variant, there are hugely more efficient manners of storing an arbitrarily
> close estimate of H in these more compact manner. (Emphasis added).

The foregoing portion of Rhoads discusses how the rows and columns of a matrix H may

be encoded in order to reduce distortion in a raw image. Neither this portion nor any other

portion of Rhoads teaches or suggests a data structure which includes whole feedback information of a type which, for example, may be used to perform an image search.

In view of the foregoing discussion, it is respectfully submitted that the Rhoads patent does not teach or suggest a data structure having recent user feedback information and whole feedback information which, for example, may be used as a basis for performing an image search. Absent these features, it is respectfully submitted that a Barber-Rhoads combination cannot render claim 1 or any of its dependent claims obvious.

Claim 2 recites that the recent feedback information of claim 1 is determined for a predetermined time period or by a predetermined frequency. The Barber and Rhoads patents individually and collectively fail to teach or suggest a data structure having recent user feedback information. It therefore logically follows that these patents also fail to teach or suggest determining information of this type for a predetermined time period or frequency.

Claim 3 recites that the recent user feedback information is a weight value learned by the user relevance feedback or a similar image information, and the whole feedback information is represented by a weight value learned by previous feedback. The Barber and Rhoads patents individually and collectively fail to teach or suggest a data structure having recent user feedback information. It therefore logically follows that these patents also fail to teach or suggest the learned weight values recited in this claim.

Claim 6 recites representing the recent user feedback by a similar image list, and reflecting a recent user feedback pattern by the similar image list using a queue algorithm. The Barber and Rhoads patents individually and collectively fail to teach or suggest a data structure having recent

user feedback information. It therefore logically follows that these patents also fail to teach or suggest the similar image list recited in this claim.

The Examiner rejected claim 4 under 35 U.S.C. §103(a) for being obvious in view of a combination formed among the Barber, Rhoads, and Blanchester patents. Applicants traverse this rejection for the following reasons.

Claim 4 depends from claim 1. In order to render claim 4 obvious, the Blanchester patent must therefore teach or suggest the features of claim 1 missing from the Barber and Rhoads patents.

The Blanchester patent discloses a system which authenticates a document by comparing it to a reference document. In rejecting claim 4, the Examiner referenced column 1, lines 64-67 and essentially column 4 of the Blancheseter patent to provide the features of the claimed invention. These portions of Blanchester disclose that in authenticating a document, bit comparisons are performed between the suspected and reference images. The bit comparisons are then analyzed to provide an indication of how reliable, or authentic, the document is.

The Blanchester patent does not perform the function of searching a database of images based on a data structure, as recited in claim 1. Blanchester also fails to teach or suggest a data structure having recent user feedback information and whole feedback information, as is also recited in claim 1. Absent these features, it is respectfully submitted that a Barber-Rhoads-Blanchester combination cannot render claim 1 obvious, and that therefore claim 4 is allowable at least by virtue of its dependency from claim 1.

Applicant further notes that claim 4 separately recites <u>recent user feedback reliability information representing how reliable the recent user feedback information is</u>, and <u>whole feedback reliability information representing how reliable the whole feedback information is</u>. Because the Blanchester patent does not teach or suggest a data structure having recent user feedback and whole feedback information, it logically follows that the type of reliability information recited in claim 4 is also missing from the Examiner's combination.

The Examiner rejected claims 11 and 12 under 35 U.S.C. §103(a) in view of a combination formed among the Barter, Rhoads, and Evelyn-Veere patents. Applicants traverse this rejection for the following reasons.

Claims 11 and 12 depend from claim 1. In order to render claims 11 and 12 obvious, the Evelyn-Veere patent must therefore teach or suggest the features of claim 1 missing from the Barber and Rhoads patents.

The Evelyn-Veere patent discloses an interactive irrigation control system. This patent does not teach or suggest a <u>data structure</u> having <u>recent user feedback information</u> and <u>whole feedback information</u>. Absent these features, it is respectfully submitted that a Barber-Rhoads-Evelyn-Veere combination cannot render claim 1 obvious, and that therefore claims 11 and 12 are allowable at least by virtue of its dependency from claim 1. It is further submitted that claims 11 and 12 separately recite features which are not taught or suggested by the cited references.

The Examiner rejected claims 14-16 under 35 U.S.C. §103(a) for being obvious in view of a combination formed among the Barber, Rhoads, and Blanchester patents. Applicants traverse this rejection for the following reasons.

Claim 14 recites many of the features which patentably distinguish claim 1 from the cited combination. For example, claim 14 recites providing a <u>data structure having recent and whole feedback information</u>. None of the cited references teach or suggest these features. Claim 14 also recites the steps of <u>updating the feedback information and their reliabilities by learning them in response to the user feedback</u>, and <u>determining the weights of the image features in proportion to reliabilities of the recent feedback information, the whole feedback information, or both the recent and whole feedback information</u>. None of these features are taught or suggested in the cited references. Claims 15 and 16 further define claim 14 in ways which are also not taught or suggested.

Based on at least the foregoing differences, it is respectfully submitted that claims 14-16 are allowable over a Barber-Rhoads-Blanchester combination.

New claims 18-20 have been added to the application and are believed to be in condition for allowance. New claim 19 recites features similar to those which patentably distinguish claims 1 and 4 from the references of record. For example, claim 19 recites a multimedia data structure reflecting change of a user relevance feedback for determining weights of image features used for an image search. The data structure includes: information describing at least one feature of a certain image; <u>recent user feedback information</u> based on user relevance feedback; <u>whole feedback information</u> based on the user relevance feedback; and <u>reliability information indicating reliability of at least one of the user feedback information and whole feedback information</u>.

Reconsideration and withdrawal of all the rejections and objections made by the Examiner is hereby respectfully requested.

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In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is respectfully requested.

Should the Examiner believe that further amendments are necessary to place the application in condition for allowance, or if the Examiner believes that a personal interview would be advantageous in order to more expeditiously resolve any remaining issues, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

To the extent necessary, Applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in fees due in connection with this application, including extension of time fees, to Deposit Account No. 16-0607 (Attorney Docket No. HI-0019) and credit any excess fees to the same Deposit Account.

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